regard the scheme as a purely scientific investigation which may throw light on fishery problems, he is prepared to endorse their recommendation, but not otherwise. In the same report Dr. J. T. Jenkins discusses the differences between the spring and autumn broods of herring, and the question whether these are the offspring of the same parent herrings (which in that case must spawn twice in the year), or whether they belong to different races of the species, one of which breeds in the spring and the other in the autumn. The question is left undecided, although it is pointed out that the alleged differences in form between the fish of the two broods are not constant.

PROF. H. F. OSBORN has sent us a budget of extracts from our American contemporary, *Science*. In one of these articles it is proposed to divide reptiles into two main sections, Synapsida and Diapsida, according to the presence, primarily, of single or double temporal arches. From a second article it is satisfactory to learn that the splendid collection of Pampean vertebrate fossils acquired by the late Prof. Cope has been unpacked in the American Museum, and is in course of being worked out. Recent investigations, it is stated in a third, have led to the abandonment of the lake-basin theory of the origin of the Tertiary strata of the great plains. Attention is likewise drawn to the large series of vertebrates—inclusive of two mammals—from the Cretaceous of Canada, recently described by Mr. **Lambe. Of considerable** interest is the provisional identification of a fossil mammal from Japan, to which reference was made some time ago in our columns, with Desmotylus, of the later Tertiary of California.

THE Saturday afternoon excursions of the London Geological Field Class, conducted by Prof. H. G. Seeley, F.R.S., will commence on April 25. Among the localities to be visited this season will be Walton-on-the-Hill, Aylesbury, Harefield, Sevenoaks, Leighton, and Tunbridge Wells. Further particulars can be obtained from the hon. sec., Mr. R. Herbert Bentley, 33 Church Crescent, Muswell Hill, N.

THE second edition of Prof. A. Winkelmann's "Handbuch der Physik," which originally appeared in 1896, is in course of publication by the firm of J. A. Barth, Leipzig. The new edition will be published in six volumes, dealing respectively with general physics, acoustics, heat, electricity and magnetism, and optics. Each volume will be complete in itself, and the editor, Prof. Winkelmann, has obtained the assistance of many well-known men of science in Germany for various branches of physics. The first half of the volume on electricity and magnetism, which we have received, shows that the complete work will be a more detailed treatise of physics than exists at present for English-reading students.

PROF. W. A. TILDEN, F.R.S., was elected president of the Chemical Society at the annual general meeting on March 25. The retiring president, Prof. J. Emerson Reynolds, F.R.S., delivered an address, in which he directed attention to the publication of some recent reports on progress in chemical research, and urged the publication of similar digests. He urged the study of "comparative chemistry" of inorganic compounds. There were few inquiries of greater interest than those involving inorganic isomerism, which was now either completely ignored or only slightly mentioned. Polymerism, or molecular condensation, was well known to exist in many inorganic compounds, as in the oxides of nitrogen, vanadium, niobium and tantalum. Silicon showed a great analogy to carbon, and it was highly probable that some of the native silicates were benzenoid combinations of $6SiO_2$. The more familiar cases of isomerism were the nitrites and sulphites, and isomerism had also been observed in the thiosulphates and the salts of the phosphorous acids. Attention was directed to some cobalt, platinum, and molybdenum compounds which showed this peculiarity. Another analogy between carbon and inorganic compounds was the curious and interesting catalytic action, referred to by Bredig under the title of "inorganic ferments." Colloid platinum solutions acted on many substances in the same way and under similar laws as enzymes. The whole subject was little known, but it suggested that the broader study of inorganic chemistry, especially in the light of our knowledge of the "organic" division of the science, was well worthy of much greater attention than it had received of late.

THE additions to the Zoological Society's Gardens during the past week include two Maholi Galagos (*Galago maholi*) from South Africa, presented by Captain Crosse; a Greenland Seal (*Phoca groenlandica*) from the Firth of Forth, presented by Mr. E. H. Bostock; two Lesser Kestrels (*Tinnunculus cenchris*), captured at sea, presented by Mr. L. Ovens; a Long-necked Chelodine (*Chelodina longicollis*), three Muricated Lizards (*Amphibolurus muricatus*), a Quoy's Lizard (*Lygosoma quoyi*) from Australia, a European Pond Tortoise (*Emys orbicularis*), European, presented by Mr. E. Hulton; a Purple-faced Monkey (*Semnopithecus cephalopterus*) from Ceylon, a White-crowned Mangabey (*Cercocebus oethiops*) from West Africa, a Fringed Gecko (*Uroplates fimbriatus*), two Green Geckos (*Phelsuma madagascariense*) from Madagascar, four Derbian Zonures (*Zonurus giganteus*), a Blessbok (*Damaliscus albifrons*) from South Africa, an Antarctic Skua (*Stercorarius antarcticus*) from the Straits of Magellan, six Amboina Box Tortoises (*Cyclemys amboinensis*), a Ceylonese Terrapin (*Nicoria trijuga*, var. *ediniana*) from India, a Raven (*Corvus corax*), European, deposited; a Mouflon (*Ovis musimon*) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

NOVA GEMINORUM.—Several observations of the new star announced by Prof. Turner on March 24 are contained in No. 3858 of the *Astronomische Nachrichten*.

Prof. Deichmüller, of Bonn, has looked up some old observations of the region, made during 1856, 1857 and 1858, and cannot find therein any record of an object having the position occupied by the Nova.

Prof. Hartwig (Bamberg) compared the Nova with two neighbouring stars, viz. B.D.+29° 1336 (given as magnitude 8·3) and B.D.+30° 1331 (given as magnitude 8·7), on March 26, and found that it was equal to the former and about 0·1m. brighter than the latter, whilst he records its colour as "bright orange." Two heliometer measures of the Nova's position, using the stars B.D.+29° 1342 and B.D.+29° 1307 as reference stars, gave for 1903 :—

$$\alpha = 6\text{h. } 38\text{m. } 0\,47\text{s.}, \quad \delta = +30^\circ\ 2'\ 27''\cdot0$$

and

$$\alpha = 6\text{h. } 38\text{m. } 0\,46\text{s.}, \quad \delta = +30^\circ\ 2'\ 31''\cdot1$$

respectively.

Prof. Hartmann and Dr. Ludendorff, using the 80 cm Potsdam refractor with the No. 1 star-spectroscope, obtained a spectrum of the Nova, with three hours' exposure, on March 29. The star then appeared to be of about the ninth magnitude, and the spectrum on the plate is extremely faint.

The hydrogen line Hβ appears as a bright emission line between λ 4857 and λ 4881, and the middle of the line is shifted about 8 Angström units towards the red. In the blue part of the spectrum there are many bright lines forming a band which has its maximum intensity from λ 4604 to λ 4672. The line Hγ is also a bright line, but is so extremely faint that it was measured with difficulty; it appears to extend from λ 4343 to λ 4356, and, like Hβ, to

have its centre shifted 8 A.U. towards the red. Prof. Hartmann deduces from this "shift" that the material emitting these bright line radiations is moving away from the earth with a velocity of 520 kilometres per second. The spectrum is similar to that of Nova Persei during the latter part of March, 1901, and this fact, taken with the similar decrease of magnitude, seems to prove that the object is truly a Nova.

The magnitude was estimated at Strassburg on March 27, 13h. (M.T. Strassburg) as 7·9, and at Utrecht on March 27, 11h. 20m. (M.T. Utrecht) as 8·1.

COOPERATIVE DETERMINATIONS OF VELOCITIES IN THE LINE OF SIGHT.—At a meeting of the Royal Astronomical Society held on March 13, Mr. Newall read a paper dealing with the results obtained at Cambridge in connection with Prof. Frost's cooperative scheme for determining the motions in the line of sight of ten selected stars.

Mr. Newall's results dealt with the stars α Arietis, α Persei, and α Boötis, and for the first named he has obtained a mean value of −14·23 kilometres per second. The measurements of the spectrum of α Persei seem to indicate that there is something peculiar, which is not yet accounted for, in the motion of this star. Fourteen photographs give a mean velocity of −2·61 kilometres per second with a probable error of ±0·28. In the case of α Boötis four of the lines, out of the seventeen which were measured, give a velocity of an entirely different order from that given by the other thirteen lines, although the lines themselves are not remarkable in other respects; two of these lines belong to the iron, one to the scandium, and one to the titanium spectrum (the *Observatory*, April).

WOLF'S RICH NEBULOUS REGION IN THE CONSTELLATION LYNX.—Writing to No. 3857 of the *Astronomische Nachrichten*, Dr. Isaac Roberts states that he photographed both H. iv55 and the new nebula mentioned by Prof. Max Wolf (*Astronomische Nachrichten*, 3847) on March 24, 1897, and included them amongst the regions given in his observatory report which appeared in the *Monthly Notices* for February, 1898.

Dr. Roberts's notes describe the second nebula as 45s. following and 14′·5 S. of H. iv55, and state that "it is a spiral nebula viewed edgewise, about 285″ of arc in diameter from south following to north preceding: nucleus stellar, equal to about seventeenth magnitude, faint indications of condensations."

THE PERIOD AND LIGHT-CURVE OF δ CEPHEI.—In No. 3853 of the *Astronomische Nachrichten* Prof. A. A. Nijland discusses the previous observations and calculations of the period and light-curve of the interesting variable δ Cephei (Ch. 8073). He compares the maxima given by his own formula and that of Schur with the chief observations made between February, 1785, and February, 1897, and arrives at the following formula as the one giving the nearest approximation to the true period:—

Maximum = 1840 September 26d. 10h. 6·2m. (M.T. Bonn)
+5d. 8h. 47m. 45·00sE − 0·00075sE² − 0·00000062 E³,

or, expressed in Julian Days:—

Maximum = J.D. 2393375·421 (M.T. Bonn)
+5·366493dE − 0·00075sE² − 0·00000062 E³.

Prof. Nijland has found during the discussion of the data that a variation of the period is suggested, and he urges the desirability of obtaining further trustworthy observations.

CONSTITUTION OF A BOARD OF SCIENTIFIC ADVICE FOR THE FURTHERANCE OF SCIENTIFIC WORK IN INDIA.

SUBJOINED is the complete text of the resolution of the Government of India referring to the appointment of a Board of Scientific Advice to organise and coordinate the scientific work done in the several Departments of the Government of India.

The application of the resources of modern science to the economic and agricultural development of the country has for many years engaged the earnest attention of the Government of India. The Famine Commissioners of 1878 laid much stress on the institution of scientific inquiry and experiment designed to lead to the gradual increase of the food-supply of the country and to the greater stability of agricultural outturn. It was considered desirable, however, first to organise the Land Record system, and so to acquire a stable basis of ascertained fact, before scientific inquiry was undertaken on any considerable scale. The necessity for such investigation was again emphasised by Dr. Vöelcker, who was deputed in 1890 to advise the Indian Government on the best course to be adopted in order to effect improvements in Indian Agriculture. At the same time the experience of recent years has indicated the increasing importance of the study of the economic products of India and of its mineral-bearing tracts, with a view to the development of the industrial and economic resources of the country.

(2) The organisation and work of the Indian Agricultural and Scientific Departments prior to 1897 have been fully described in the important series of Resolutions which issued in that year, and especially in the fourth and fifth Resolutions of the series. These contain a clear exposition of the policy of the Government of India in establishing departments of scientific research to promote the industries of the country and investigate its undeveloped resources, and they describe the means adopted to give effect to that policy. They further show how undue prominence had been given in the past to pure science, to the neglect of its economic application, and they affirm the necessity of extending the economic side of inquiry, and of coordinating the labours of the different departments on the basis of a well-considered working plan.

(3) The policy laid down in these Resolutions has been steadily pursued, though its development has been retarded by an unfavourable cycle of seasons, which seriously affected the financial resources of the Government of India. To the Geological Department two practical mining experts have been added, while each year a portion of the scientific staff devote themselves to inquiries connected with the mineral resources of India. A cryptogamic botanist has been appointed, whose special duty it is to study the fungoid diseases of agricultural staples, such as rust in wheat, which causes such serious and widespread loss to the country. In Madras a botanist has been permanently entertained whose attention will be mainly devoted to economic inquiry. And of late years the attention of the officers of the Botanic Survey has been more and more directed to questions of practical importance to the country. The establishment of the Reporter on Economic Products has been strengthened, and a Curator with special qualifications as an economic chemist has been added to it and provided with a laboratory, while one agricultural chemist pursues his inquiries at Dehra Dun, and it is proposed to procure another for Madras. An entomologist has for some time past been added to the staff of the Indian Museum; a specially qualified Forest officer has been deputed for investigation of the insect pests which devastate the forests, while the Secretary of State has been asked to secure the services of a skilled entomologist in order to conduct similar inquiries in connection with the agricultural and industrial staples of India. In the Civil Veterinary Department a highly skilled bacteriologist is studying the diseases which prove so fatal to agricultural stock in India. An agricultural expert has recently been added to the Provincial staff of the United Provinces. Finally, an Inspector General of Agriculture has been appointed whose function it is to guide and correlate the agricultural inquiries carried on throughout India, whether by the Imperial or the Provincial Governments, and to act as an adviser to both in all matters pertaining to agriculture, while under him work, or will work, the agricultural chemist, the entomologist and the cryptogamic botanist.

(4) The Government of India now desire to provide, as far as possible, for that coordination of scientific inquiry which the development of the machinery of the various departments has rendered more than ever essential. The work of many of the members of the scientific staff covers fields in which experiments of a similar or cognate character are being independently conducted. Thus in chemistry we have several investigators following parallel lines of research; in economic botany there are two departments working independently of each other; in economic entomology